

Service Manual

Cassette Deck

RS-M229X

 (Silver Face)
(Black Face)

 dbx/Dolby NR-Equipped
Stereo Cassette Deck


This is the Service Manual for the following areas.

- ☐ For all European areas except United Kingdom.
- ☐ For United Kingdom.
- ☐ For Asian PX.
- ☐ For European PX.

RS-M229X in black is also available in some countries.

RS-M24 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback	Fast forward and	
Tape speed:	4.8cm/s	rewind time:	Approx. 90 seconds with C-60 cassette tape
Wow and flutter:	<input type="checkbox"/> ...0.05% (WRMS), $\pm 0.14\%$ (DIN) <input type="checkbox"/> ...0.048% (WRMS)	Inputs:	MIC; sensitivity 0.25mV applicable microphone impedance 400 Ω —10k Ω LINE; sensitivity 60mV input impedance 47k Ω or more
Frequency response:	Metal tape; <input type="checkbox"/> ...20—17,000 Hz 25—16,000 Hz (DIN) 30—15,000 Hz ± 3 dB <input type="checkbox"/> ...20—18,000 Hz CrO ₂ tape; <input type="checkbox"/> ...20—16,000 Hz 25—15,000 Hz (DIN) 30—14,000 Hz ± 3 dB <input type="checkbox"/> ...20—18,000 Hz Normal tape; <input type="checkbox"/> ...20—15,000 Hz 25—14,000 Hz (DIN) 30—13,000 Hz ± 3 dB <input type="checkbox"/> ...20—17,000 Hz	Outputs:	LINE; output level 400mV, output impedance 2.3k Ω or less HEADPHONES; output level 80mV (at 8 Ω) applicable headphone impedance 8 Ω —600 Ω
Dynamic range:	110dB (at 1kHz) with dbx in	Bias frequency:	80kHz
Max. input level	improvement: 10dB or more improved with dbx in (at 1kHz)	Heads:	2-head system 1-MX head for record/playback 1-double-gap ferrite head for erasure
Signal-to-noise ratio:	dbx in; 92dB Dolby [®] B NR in; <input type="checkbox"/> ...66dB (CCIR) <input type="checkbox"/> ...67dB (CCIR) NR out; 57dB (Signal level = max. input level A weighted, CrO ₂ type tape)	Motor:	1-motor system (Electrical governor motor)
		Power requirements:	<input type="checkbox"/>AC; 220V, 50-60Hz <input type="checkbox"/>AC; 110/125/220/240V, 50-60Hz <input type="checkbox"/>Pre-set power voltage 240V <input type="checkbox"/>Pre-set power voltage 125V <input type="checkbox"/>Pre-set power voltage 220V
		Power consumption:	12W
		Dimensions:	43cm(W)×10.9cm(H)×23.3cm(D)
		Weight:	4 kg

Design and specifications are subject to change without notice.

* The term dbx is a registered trademark of dbx Inc.

** 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

Technics

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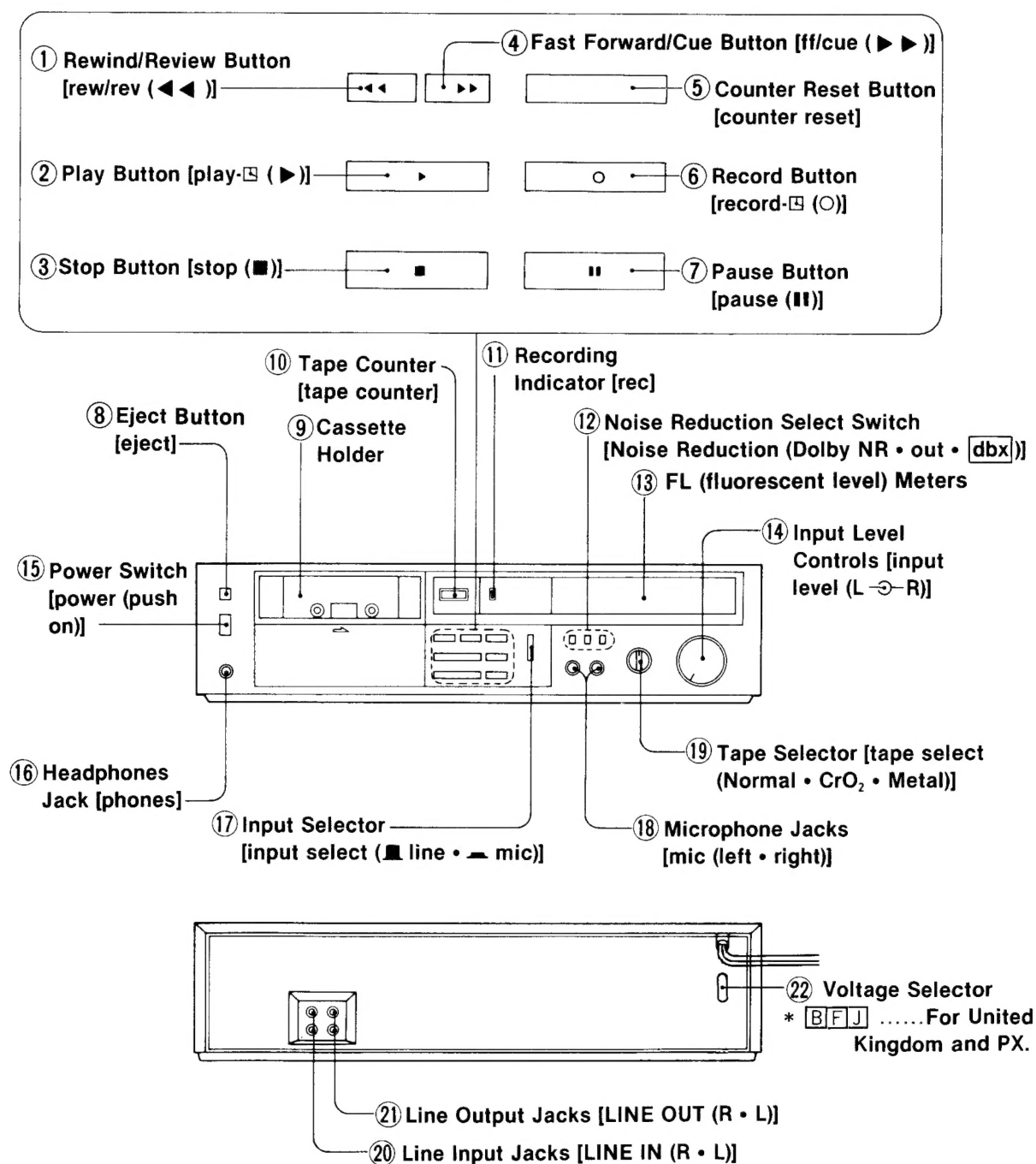
Matsushita Electric Trading Co., Ltd.

P.O. Box 288, Central Osaka Japan

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LOCATION OF CONTROLS AND COMPONENTS



DISASSEMBLY INSTRUCTIONS

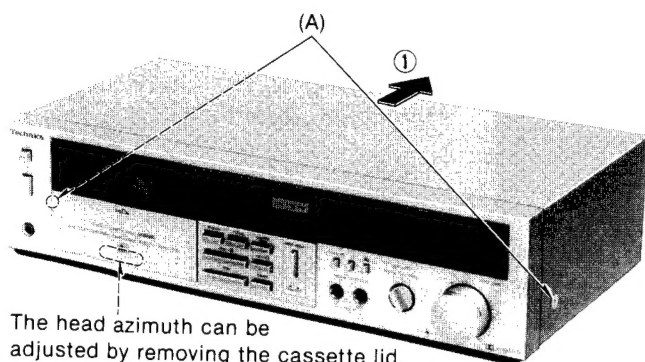


Fig. 1

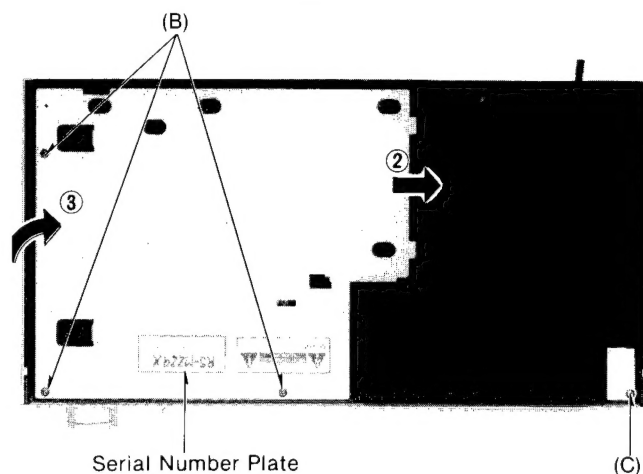


Fig. 2

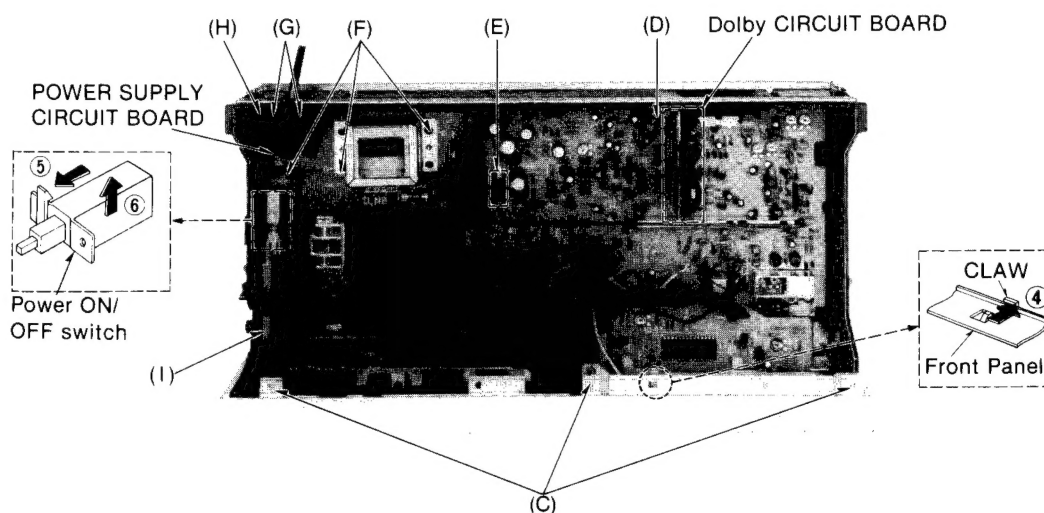
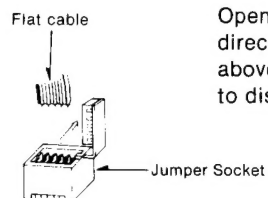


Fig. 3

(E) How to remove flat cable



Open the lid of socket in the direction of the arrow as shown above, and extract the flat cable to disconnect.

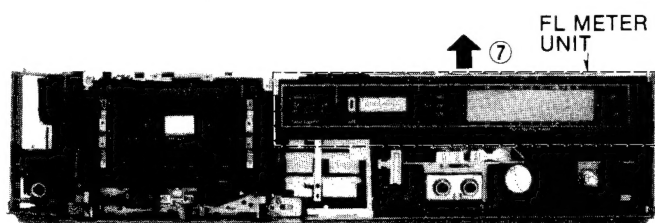


Fig. 4

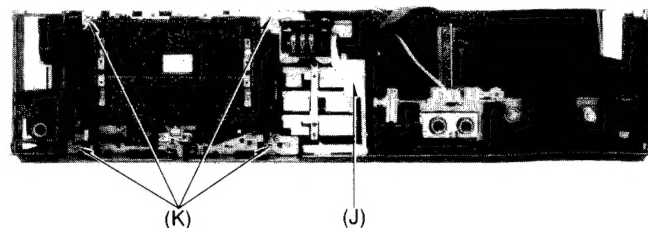


Fig. 5

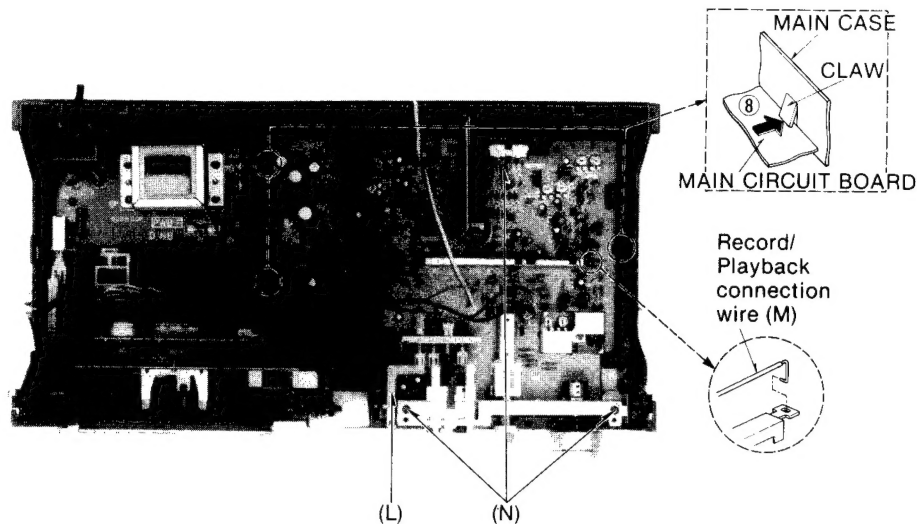


Fig. 6

Ref. No.	Procedure	To remove —.	Remove —.	Shown in fig. —.
1	1	Main case	<ul style="list-style-type: none"> • 2 ornament screws(A) • As shown in fig. 1, slide the case cover in the direction of arrow ①. 	1 1
2	2	Bottom cover	<ul style="list-style-type: none"> • 3 screws(B) • Slide the bottom cover in the direction indicated by arrow ②, then raise the bottom cover in the direction indicated by arrow ③. 	2 2
3	1 → 2 → 3	Front panel assembly	<ul style="list-style-type: none"> • 4 screws(C) • As shown in fig. 3, push the claw in the direction of arrow ④. 	2, 3 3
4	1 → 4	Dolby circuit board	<ul style="list-style-type: none"> • 1 red screw(D) • Pull out the Dolby circuit board. 	3 3
5	1 → 5	Power supply circuit board	<ul style="list-style-type: none"> • Connector ④(E) • 3 red screws.....(F) • 2 screws(G) • Cord clamber(H) • Pull out the power switch rod(I) • As shown in fig. 3, push the claw in the direction of arrow ⑤, lift the power ON/OFF switch in the direction of arrow ⑥. 	3 3 3 3 3 3
6	1 → 2 → 3 → 6	FL meter unit	<ul style="list-style-type: none"> • As shown in fig. 4, pull out the FL meter unit in the direction of arrow ⑦. 	4
7	1 → 2 → 3 → 6 → 7	Mechanism unit	<ul style="list-style-type: none"> • Reset lever(J) • 4 red screws.....(K) 	5 5
8	1 → 2 → 3 → 6 → 8	Main circuit board	<ul style="list-style-type: none"> • Pull out the switch rod(L) • Record/playback connection wire...(M) • 3 red screws.....(N) • As shown in fig. 6, push the claw in the direction of arrow ⑧, then pull out the main circuit board. 	6 6 6 6

* Serial No. Indication

- The serial number plate of this product is attached to the bottom cover. (Shown in fig. 2.)

OPERATING PRECAUTIONS

- If the Record Button or the Play Button is pressed immediately after the power has gone off, the head section will remain raised. This means that the tape will not be ejected even when the Eject Button is pressed. In cases like this, switch on the power again.

MEASUREMENT AND ADJUSTMENT METHODS

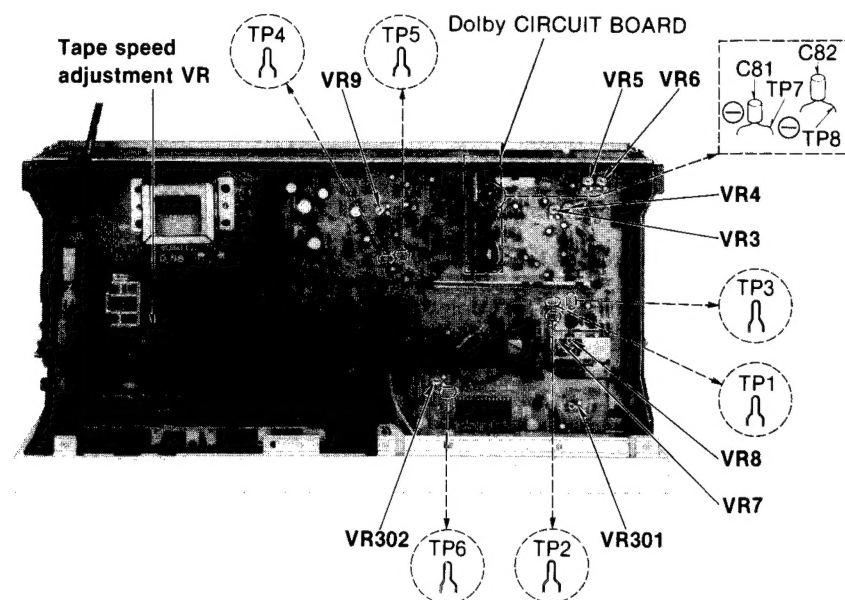
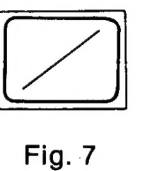
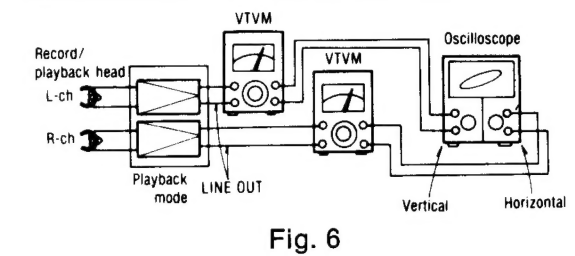
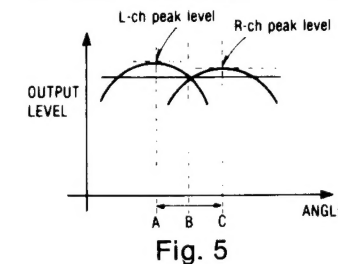


Fig. 1

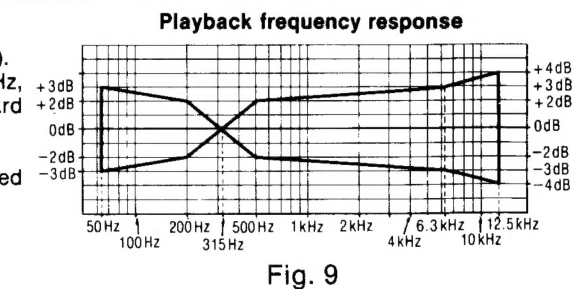
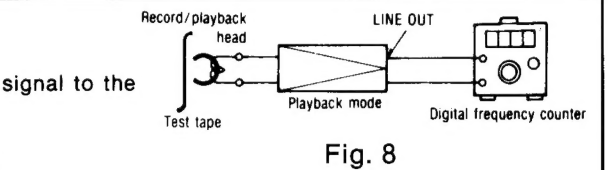
NOTES: Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- Make sure capstan and pressure roller are clean
- Judgeable room temperature 20±5°C (68±9°F)
- NR switch: OUT
- Input level controls: Maximum

<p>A Head position adjustment</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback and pause mode <p>(The head adjusting plate is provided to adjust the tape touch of the head in cue or review mode.)</p> <ol style="list-style-type: none"> 1. Press the playback button and pause button. 2. Measure the space between the pressure roller and the capstan. <p>Standard value: 0.5±0.3mm</p> <ol style="list-style-type: none"> 3. If the measured value is not within the standard value, untighten screw (A) and slide the head adjusting plate in the direction of arrow (B) for adjustment. 	<p>Fig. 2</p>
<p>B Head azimuth adjustment</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode • Normal tape mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape (azimuth)...QZZCFM <p>L-CH/R-CH output balance adjustment</p> <ol style="list-style-type: none"> 1. Make connections as shown in fig. 3. 2. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) in fig. 4 for maximum output L-CH and R-CH levels. When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows. 3. Turn screw (B) shown in fig. 4 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., and point where L-CH and R-CH outputs are balanced. (Refer to figs. 4 and 5.) <p>L-CH/R-CH phase adjustment</p> <ol style="list-style-type: none"> 4. Make connections as shown in fig. 6. 5. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) shown in fig. 4 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 7 is obtained on the oscilloscope. 	<p>Fig. 3</p> <p>Fig. 4</p>



<p>C Tape speed</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode <p>Equipment:</p> <ul style="list-style-type: none"> • Digital frequency counter • Test tape...QZZCWAT 	<p>Tape speed accuracy</p> <ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 8. 2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter. 3. Measure this frequency. 4. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100(\%) \quad \text{where, } f = \text{measured value}$ <ol style="list-style-type: none"> 5. Take measurement at middle section of tape. <p>Standard value: ±1.5%</p> <ol style="list-style-type: none"> 6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1. <p>Tape speed fluctuation</p> <p>Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:</p> $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100(\%) \quad f_1 = \text{maximum value, } f_2 = \text{minimum value}$ <p>Standard value: Less than 1%</p> <p>NOTE: Please use non metal type screwdriver when you adjust tape speed on this unit.</p>
<p>D Playback frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode • Normal tape mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape...QZZCFM 	<p>Playback frequency response</p> <ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 3. 2. Playback the frequency response portion of test tape (QZZCFM). 3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT. 4. Make measurements for both channels. 5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 9).
<p>E Playback gain</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode • Normal tape mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape...QZZCFM 	<p>Standard value: 0.42V [0.38V±1dB: at LINE OUT jack]</p> <p>Adjustment</p> <ol style="list-style-type: none"> 1. If the measured value is not within standard the adjust VR3 (L-CH) or VR4 (R-CH) (See fig. 1). 2. After adjustment, check "Playback frequency response" again.



⑤ Erase current

Condition:
• Record mode
• Metal tape mode

Equipment:
• VTVM
• Oscilloscope

1. Test equipment connection is shown in fig. 10.
2. Place UNIT into metal tape mode.
3. Press the record and pause buttons.
4. Read voltage on VTVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R154}}{1 (\Omega)}$$

Standard value: 155±15mA (Metal)

5. If measured value is not within stand, adjust as follows.

Adjustment

1. Short point (B) and open point (A) on the main circuit board. Refer to the wiring connection diagram on page 15.
2. Measure the erase current.
3. If the erase current is less than 140mA, short the point (A).
4. If the erase current is more than 170mA, open the point (B).

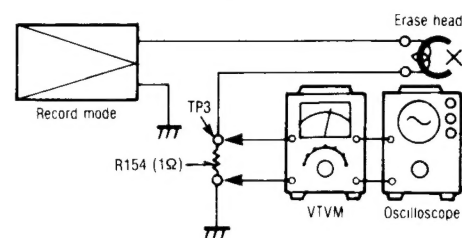


Fig. 10

⑥ Overall frequency response

Condition:
• Record/playback mode
• Normal tape mode
• CrO₂ tape mode
• Metal tape mode
• Input level controls...MAX

Equipment:
• VTVM
• ATT
• AF oscillator
• Oscilloscope
• Resistor (600Ω)
• Test tape (reference blank tape)
...QZZCRA for Normal
...QZZCRX for CrO₂
...QZZCRZ for Metal

Note:

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 11.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is -20dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, and 10kHz signal, and record these signals on the test tape.
6. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 12). (If the curve is within the charted specifications, proceed to steps 7, 8 and 9.) If the curve is not within the charted specifications, adjust as follows;

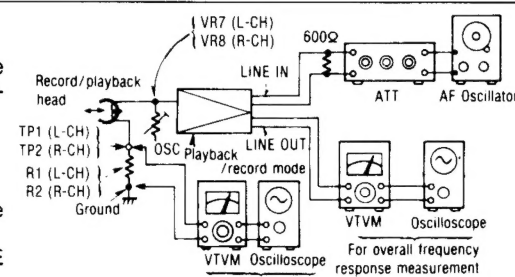


Fig. 11

Overall frequency response chart (Normal)

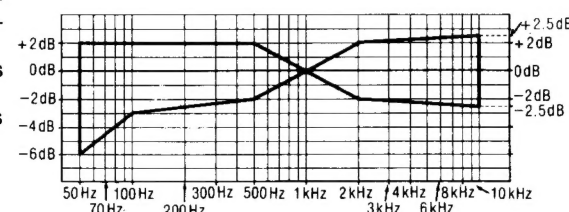


Fig. 12

Adjustment (A):

When the curve exceeds the overall specified frequency response chart (fig. 12) as shown in fig. 13.

- 1) Increase bias current by tuning VR7 (L-CH) and VR8 (R-CH). (See fig. 1 on page 5).
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 12.)
- 3) If the curve still exceeds the specifications (fig. 12), increase bias current further and repeat steps 5 and 6.

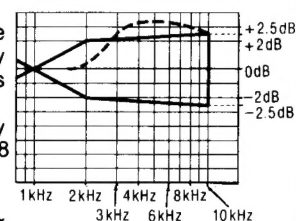


Fig. 13

Adjustment (B):

When the curve falls below the overall specified frequency response chart (fig. 12) as shown in fig. 14.

- 1) Reduce bias current by tuning VR7 (L-CH) and VR8 (R-CH).
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 12.)
- 3) If the curve still falls below the charted specifications (fig. 12), reduce bias current further and repeat steps 5 and 6.

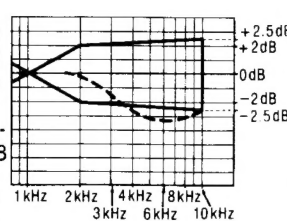


Fig. 14

7. Place UNIT into CrO₂ tape mode.

8. Change test tape to CrO₂ reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 15kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO₂ tapes (fig. 15).

9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz and 12.5kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 15).

10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.

- Read voltage on VTVM between ground and test point (TP1 for L-CH, TP2 for R-CH) and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$$

around 400μA (Normal position)
Standard value: around 515μA (CrO₂ position)
around 720μA (Metal position)

Overall frequency response chart (CrO₂, Metal)

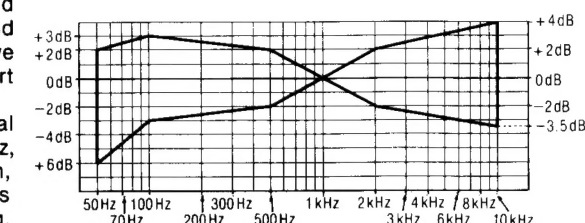


Fig. 15

⑦ Overall gain

Condition:
• Record/playback mode
• Normal tape mode
• Input level controls...MAX
• Standard input level;
MIC-71±4dB
LINE-24±4dB

Equipment:
• VTVM
• AF oscillator
• ATT
• Oscilloscope
• Resistor (600Ω)
• Test tape (reference blank tape)
...QZZCRA for Normal

1. Test equipment connection is shown in fig. 16.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (-24dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.38V.
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes 0.38V.
7. If measured value is not 0.38V±2dB, adjust it by using VR5 (L-CH) or VR6 (R-CH).
8. Repeat from step (2).

Standard value 0.38V-2dB (300mV)—0.38V + 2dB (480mV)

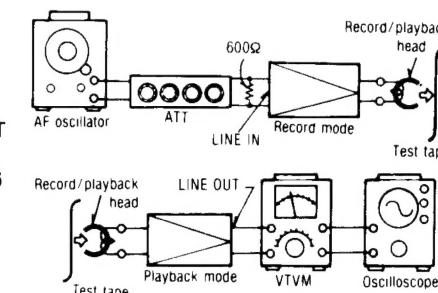


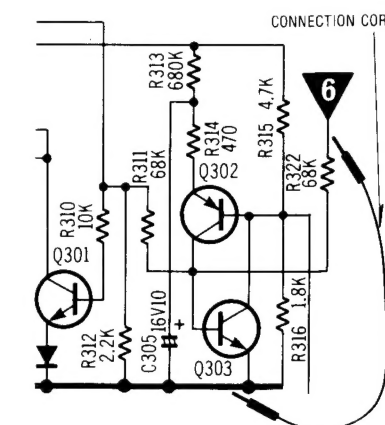
Fig. 16

⑧ Fluorescent meter

Condition:
• Record mode
• Input level controls...MAX

Equipment:
• VTVM
• ATT
• AF oscillator

1. Test equipment connection is shown in fig. 16.
2. Connect a wire between TP6 and ground (See fig. 16).
3. Supply a 1kHz signal through ATT (-24dB) to the LINE IN jack, then place the unit into the record mode.
4. Adjust the ATT so that the output level at LINE OUT becomes 0.38V (The input level at this condition is called the standard input level).
5. Adjustment at "-20dB":
A. Adjust the ATT so that input level is -20dB below the standard input level.
B. Adjust VR301 so that the -20dB segment of the FL meter lights up with the input level of -20±1dB below the standard input level (L-CH ONLY) (See fig. 20).
6. Adjustment at "0dB".
A. Adjust the ATT so that the output level at LINE OUT becomes 0.38V. (The input level at this condition is called the standard input level).
B. Adjust VR302 so that the +1dB segment of the FL meter lights up with the input level of 0±0.4dB range of the standard input level (See fig. 21).
7. Repeat twice between steps (5) and (6) above.
8. Adjust ATT and check that all segments light up when an input signal level is increased to 10dB higher than the standard input level (See fig. 22).
9. Disconnect the wire between peak reset terminal and ground, which had been connected at step 2.



BLOCK DIAGRAM (for L-CH only)

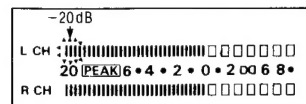
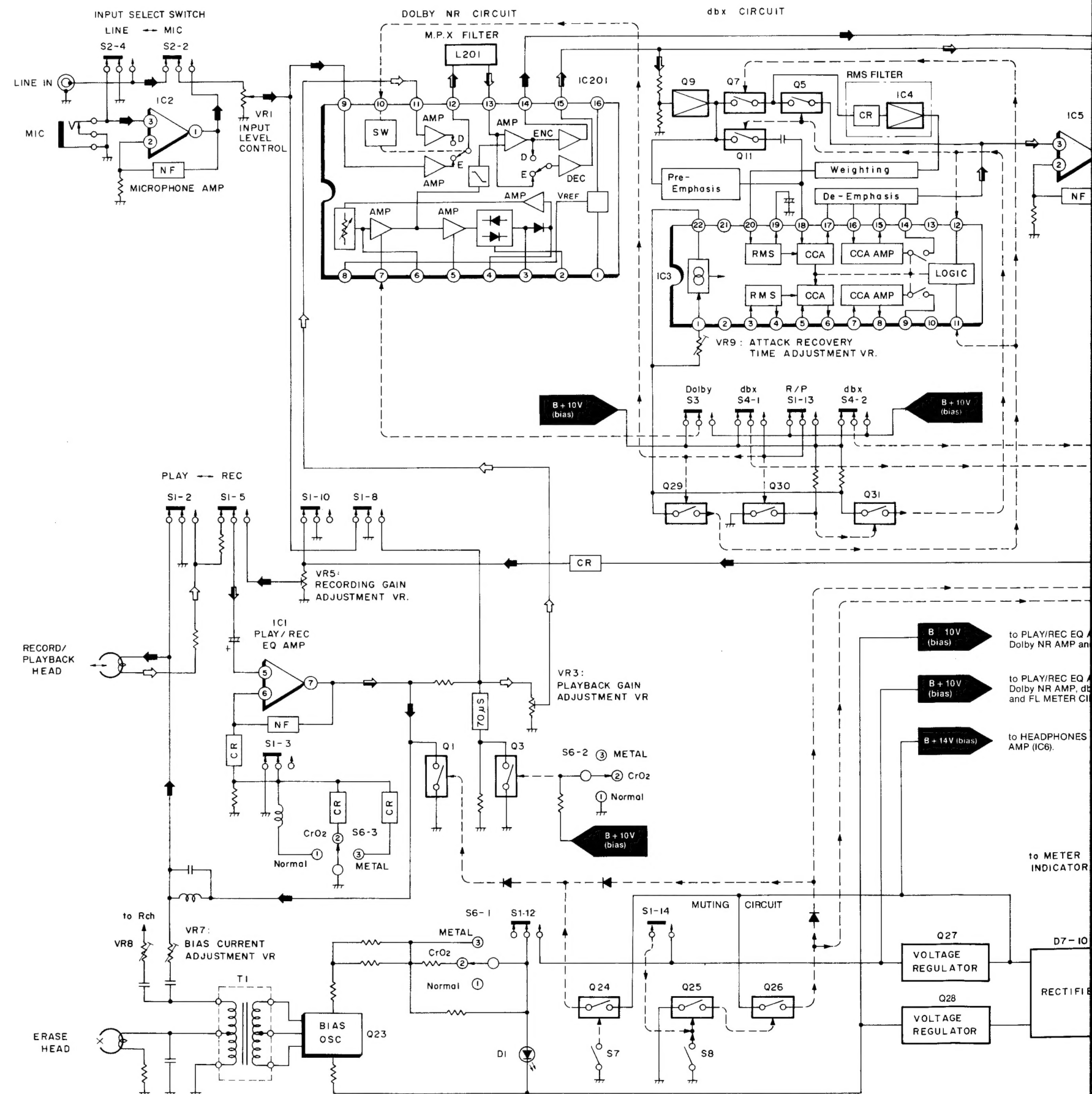


Fig. 20

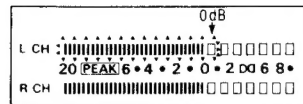


Fig. 21

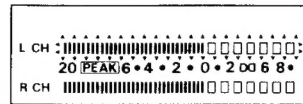


Fig. 22

Dolby NR circuit

Condition:

• Record mode

• NR select switch...

OUT/Dolby NR

• Input level controls...MAX

Equipment:

• VTVM

• ATT

• Resistor (600Ω)

• AF oscillator

• Oscilloscope

1. Make connections as shown in fig. 23.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at TP7 (L-CH) and TP8 (R-CH) is 17.5mV.
5. The output level at pin 14 should be 0dB.
6. Set the NR select switch to Dolby NR, and make sure that the output signal level at pin 14 of IC201 (L-CH) and IC202 (R-CH) is 8 ± 1.5 dB.

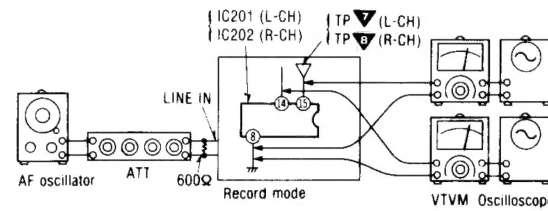


Fig. 23

Attack recovery time adjustment (dbx circuit)

Condition:

• Record mode

• Input level control...MAX

• Balance control...Center

• Noise reduction selector

...dbx

Equipment:

• VTVM

• ATT

• AF oscillator

• DC voltmeter

1. Make the connections as shown in fig. 24 and apply 1kHz -27dB signal from LINE IN, and set the noise reduction selector to dbx position.
2. Set the unit to record mode. adjust ATT so that the signal level at C79 (L-CH) and C80 (R-CH) is 300mV.
3. Read voltage on DC voltmeter.

Reference value: 15 ± 0.5 mV

4. If measured value is not within reference, adjust VR9 (shown in fig. 1).

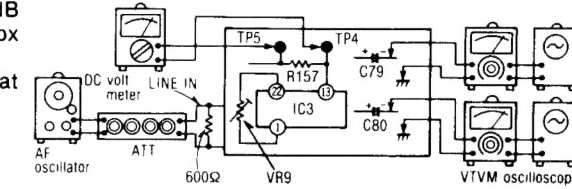
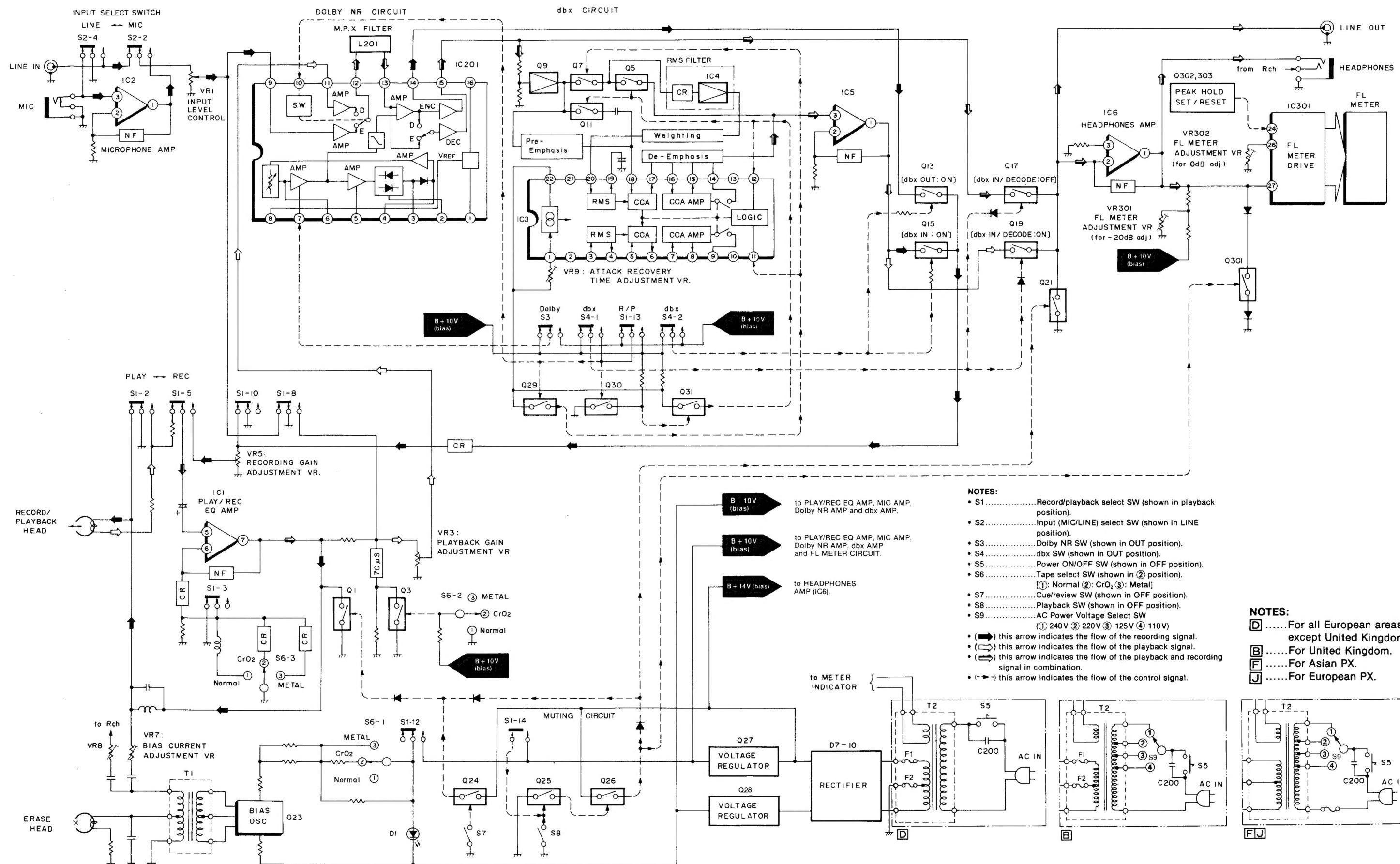
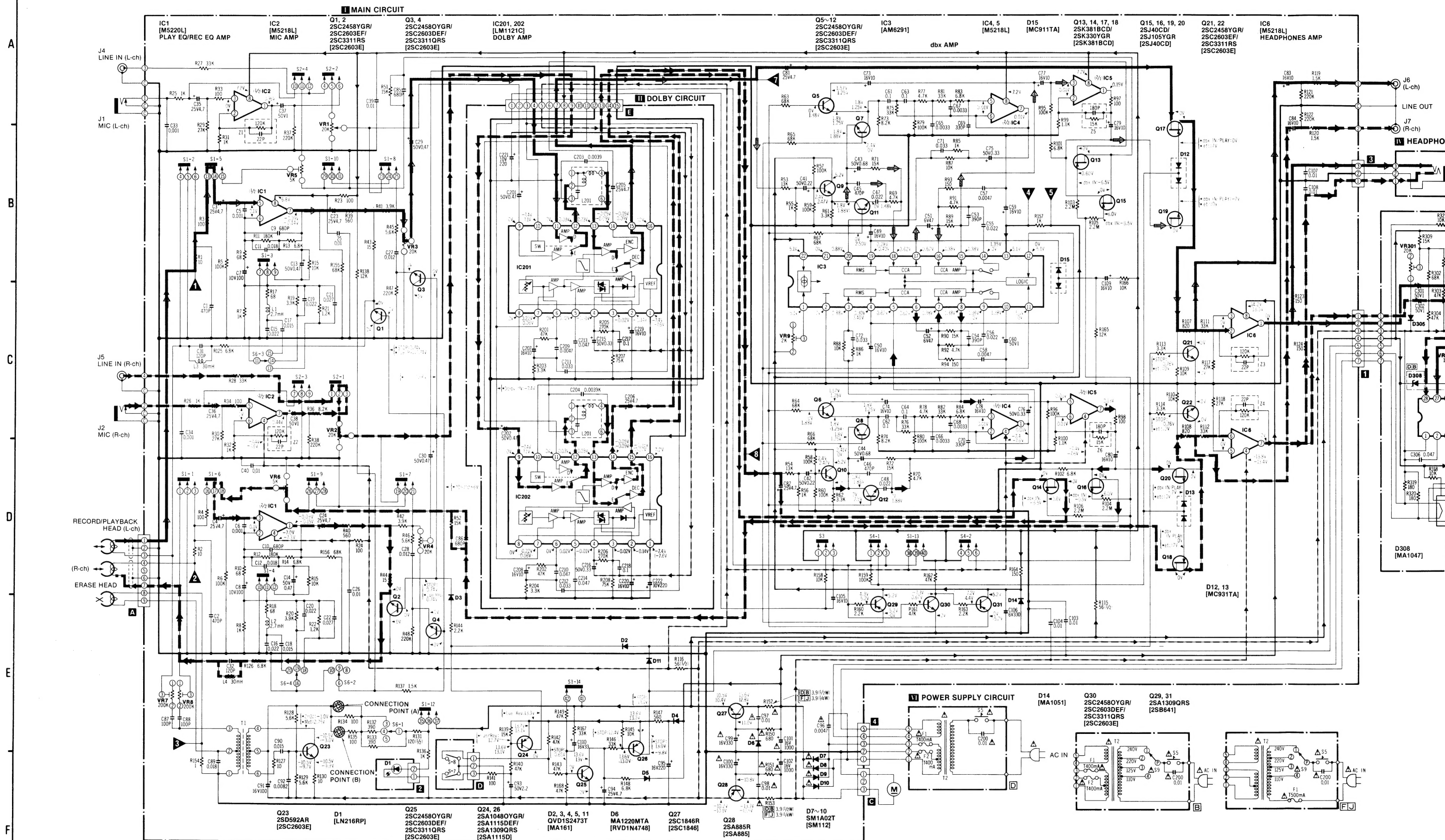


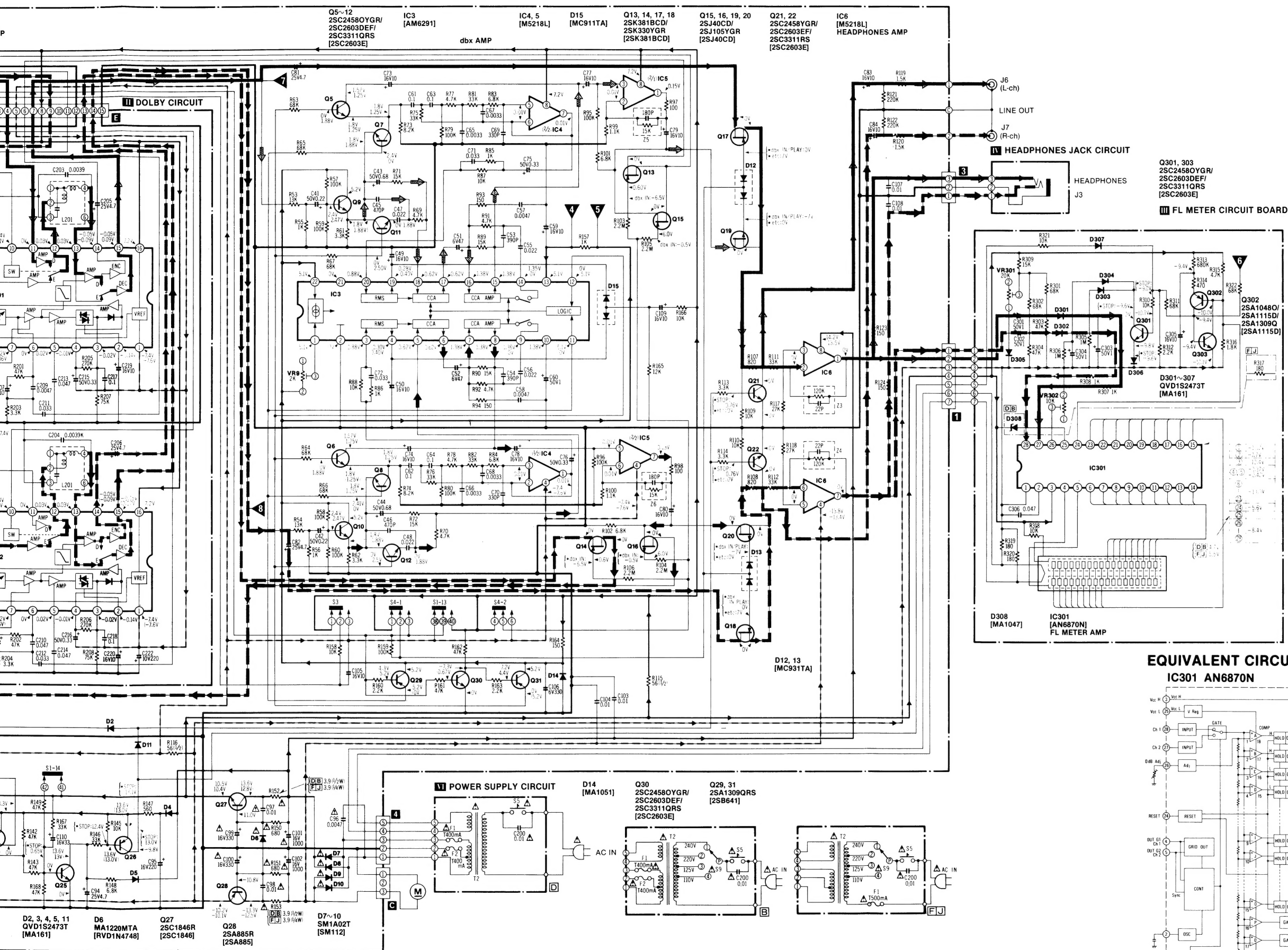
Fig. 24

BLOCK DIAGRAM (for L-CH only)



SCHEMATIC DIAGRAM





- NOTES:**
- S1 Record/playback select switch (shown in playback position).
 - S2 Input (MIC/LINE) select switch (shown in LINE position).
 - S3 Dolby NR switch (shown in OUT position).
 - S4 dbx switch (shown in OUT position).
 - S5 Power ON/OFF switch (shown in OFF position).
 - S6 Tape select switch (shown in (2) position).
[(1): Normal, (2): CrO₂, (3): Metal]
 - S7 Cue/review switch (shown in OFF position).
 - S8 Playback switch (shown in OFF position).
 - S9 AC Power voltage select switch.
 - VR1, 2 Input level controls.
 - VR3, 4 Playback gain adjustment VR.
 - VR5, 6 Recording gain adjustment VR.
 - VR7, 8 Bias current adjustment VR.
 - VR9 Attack recovery time adjustment VR.
 - VR301 FL meter adjustment VR ("0dB" indication).
 - VR302 FL meter adjustment VR ("20dB" indication).
 - Connection points (A) and (B).....Erase current adjustment points.
 - Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
1K = 1,000(Ω), 1M = 1,000k(Ω).
 - Capacity are in micro-farads (μF) unless specified otherwise.
 - The mark (▼) shows test point. e.g. ▼ = Test point 1.
 - Important safety notice
Components identified by ▲ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
 - All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
 - No mark Voltage values at OUT (NR select switch) mode.
() Voltage values at record mode.
STOP Voltage values at stop mode.
CUE/REV Voltage values at cue or review mode.
CrO₂ Voltage values at CrO₂ tape mode.
Metal Voltage values at metal tape mode.
70μS Voltage values at CrO₂ or metal tape mode.
Dolby IN Voltage values at Dolby IN mode.
dbx IN/PLAY Voltage values at dbx IN and playback mode.
For measurement, use VTVM.
 - indicates B+ (bias).
 - indicates B- (bias).
 - indicates the flow of the playback signal. (NR out).
 - indicates the flow of the recording signal. (NR out).
 - indicates the flow of the playback signal. (dbx IN).
 - indicates the flow of the record signal. (dbx IN).
 - Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes.
One type of number is used for supply parts number and production parts number when they are identical.
e.g. Q1
2SC1844(E,F).....Production parts number
[2SC1844E].....Supply parts number
D12
1S2473T77.....Production parts number
[MA161].....Supply parts numbers
 - The supply parts number is described alone in the replacement parts list.
 - This schematic diagram may be modified at any time with the development of new technology.

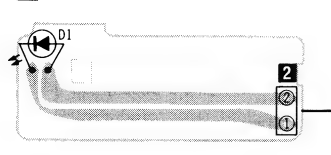
SPECIFICATIONS * Input level controls...MAX

Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO ₂ ...QZZCRZ for Metal	Less than 4%
Overall S/N ratio * Test tape...QZZCRA	Greater than 43dB (without NAB filter)

- NOTES:**
- For all European areas except United Kingdom.
 - For United Kingdom.
 - For Asian PX.
 - For European PX.

CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

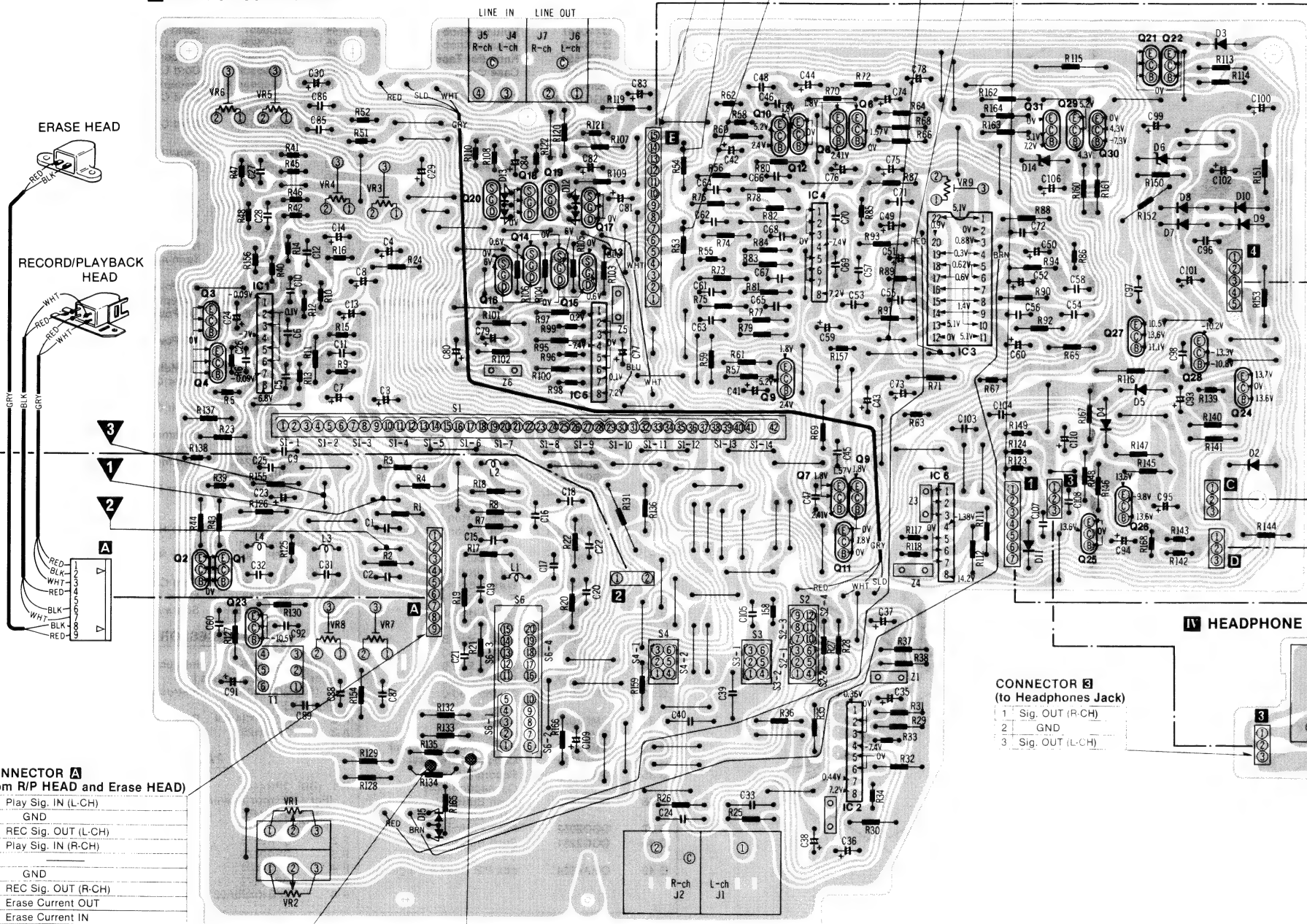
I LED CIRCUIT BOARD



CONNECTOR 2 (to Dolby Circuit)

1 NR Change Sig. OUT	9 Encode Sig. OUT (R-CH)
2 Encode Sig. OUT (L-CH)	10 Decode Sig. OUT (R-CH)
3 Encode/Decode Change Sig. OUT	11 Decode Sig. OUT (R-CH)
4 Decode Sig. OUT (L-CH)	12 GND
5 B+ (bias) OUT	13 Encode Sig. IN (R-CH)
6 Encode Sig. IN (L-CH)	14 Encode/Decode Sig. IN (R-CH)
7 Encode/Decode Sig. IN (L-CH)	15 GND
8 B+ (bias) OUT	

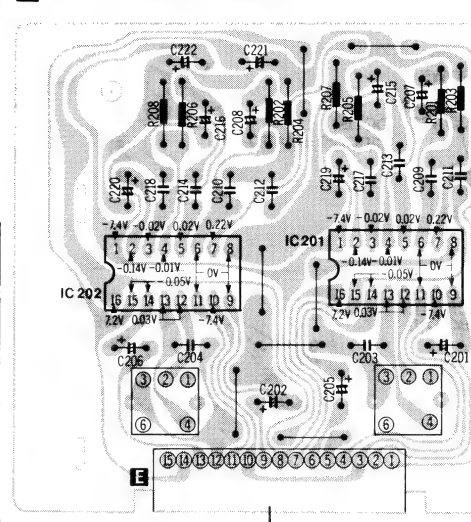
II MAIN CIRCUIT BOARD



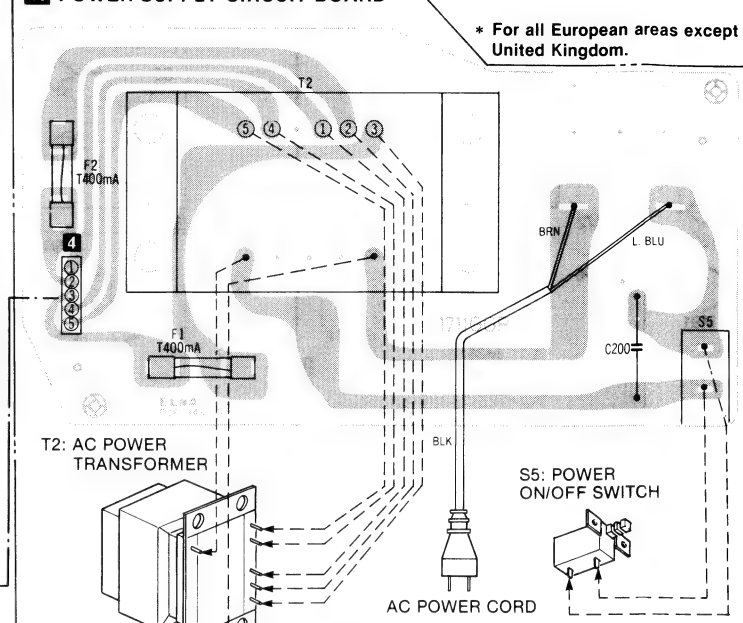
CONNECTOR 1 (to FL Meter Circuit)

1 Sig. OUT (R-CH)
2 Sig. OUT (L-CH)
3 GND
4 B+ (bias)
5 Muting. Sig. OUT
6 AC Voltage

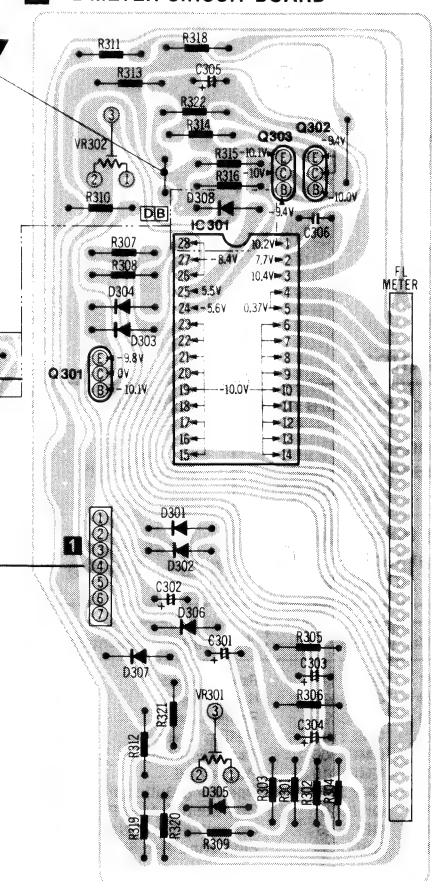
III DOLBY CIRCUIT BOARD



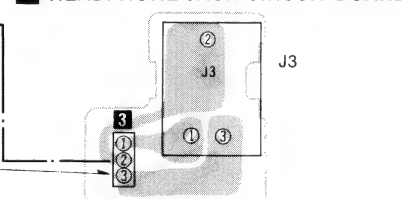
IV POWER SUPPLY CIRCUIT BOARD



V FL METER CIRCUIT BOARD



VI HEADPHONE JACK CIRCUIT BOARD



CONNECTOR 3 (to Headphones Jack)

1 Sig. OUT (R-CH)
2 GND
3 Sig. OUT (L-CH)

NOTES:

BLKBlack
BLUBlue
BRNBrown
GRYGray
GRNGreen
L. BLULight Blue
NILNo Color Mark
ORGOrange
PNKPink
REDRed
SLDShield Wire
VLTViolet
WHTWhite
YELYellow

NOTES:

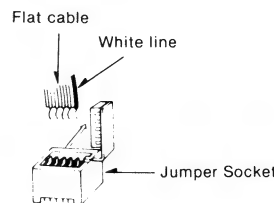
- The circuit shown in [] on the conductor side indicates printed circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.

For measurement, use VTVM.

• This circuit board diagram may be modified at any time with the development of new technology.

Connection of a flat cable

To connect a flat cable, direct the cable so that its white line faces the right side as shown below, then insert the cable into a jumper socket and close the lid of the jumper socket.



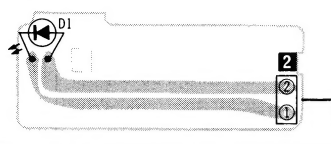
NOTES:

- []For all European areas except United Kingdom.
- []For United Kingdom.
- []For Asian PX.
- []For European PX.

CONNECTION POINT (A) CONNECTION POINT (B)

CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

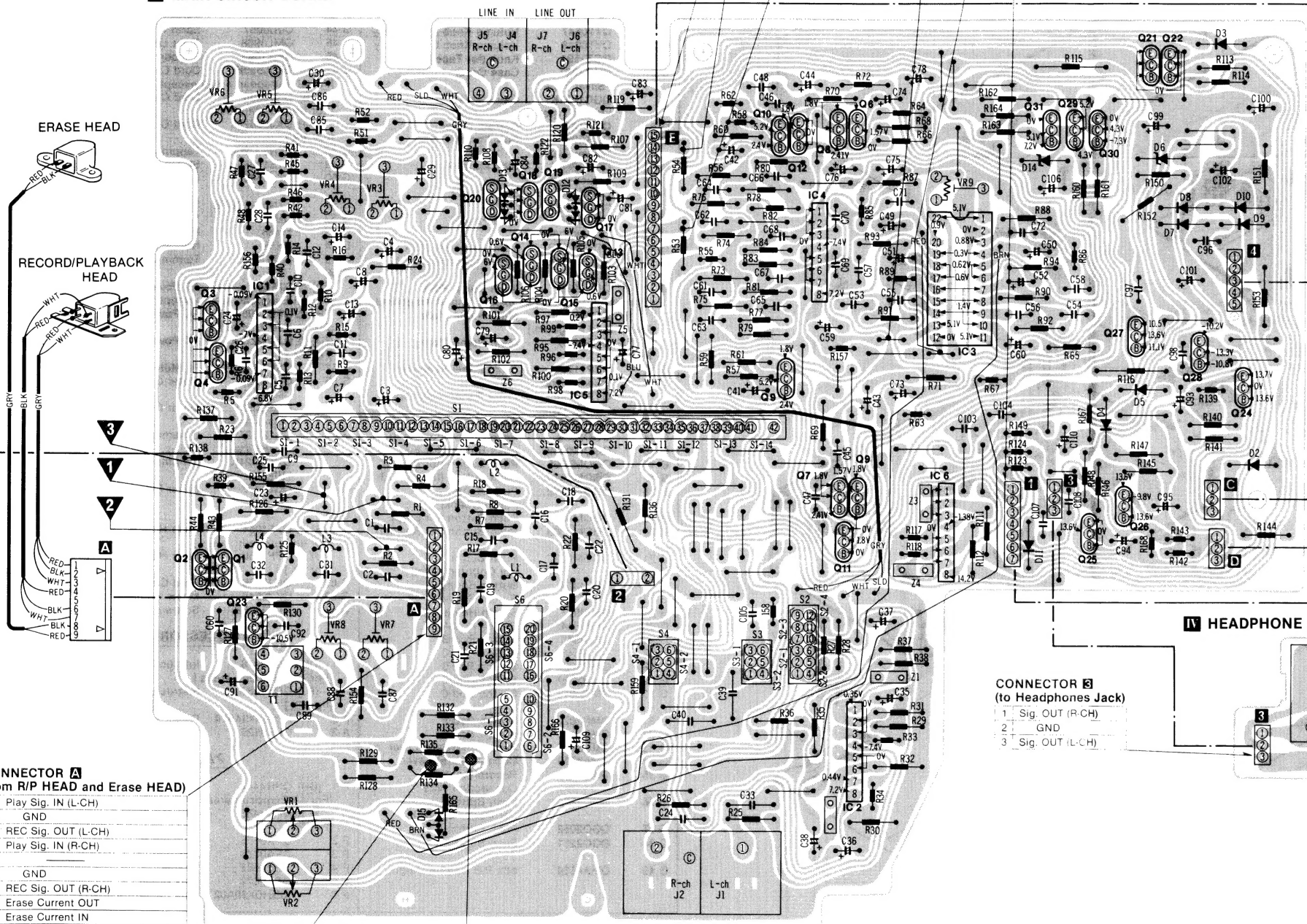
I LED CIRCUIT BOARD



CONNECTOR E (to Dolby Circuit)

1 NR Change Sig. OUT	9 Encode Sig. OUT (R-CH)
2 Encode Sig. OUT (L-CH)	10 Decode Sig. OUT (R-CH)
3 Encode/Decode Change Sig. OUT	11 Decode Sig. OUT (L-CH)
4 Decode Sig. OUT (L-CH)	12 GND
5 B+ (bias) OUT	13 Encode Sig. IN (R-CH)
6 Encode Sig. IN (L-CH)	14 Encode/Decode Sig. IN (R-CH)
7 Encode/Decode Sig. IN (L-CH)	15 GND
8 B+ (bias) OUT	

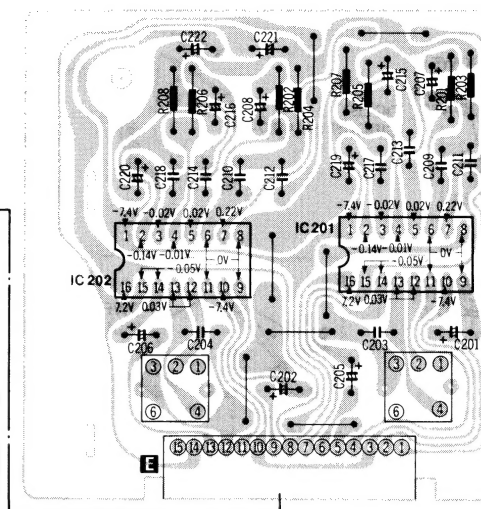
II MAIN CIRCUIT BOARD



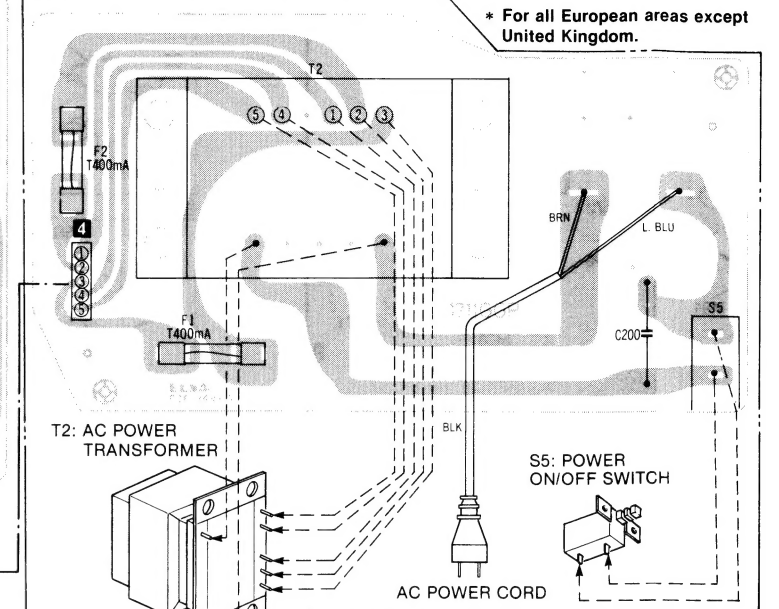
CONNECTOR I (to FL Meter Circuit)

1 Sig. OUT (R-CH)
2 Sig. OUT (L-CH)
3 GND
4 B+ (bias)
5 Muting. Sig. OUT
6 AC Voltage

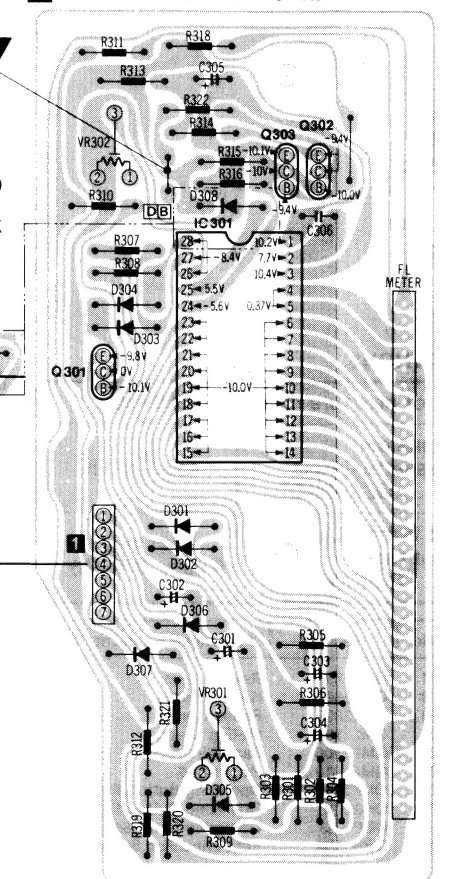
III DOLBY CIRCUIT BOARD



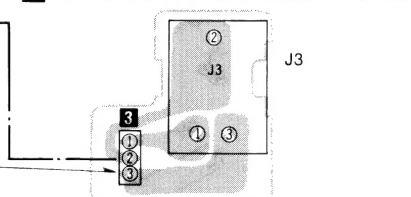
IV POWER SUPPLY CIRCUIT BOARD



V FL METER CIRCUIT BOARD



VI HEADPHONE JACK CIRCUIT BOARD



CONNECTOR E (to Headphones Jack)

1 Sig. OUT (R-CH)
2 GND
3 Sig. OUT (L-CH)

NOTES:

BLKBlack
BLUBlue
BRNBrown
GRYGray
GRNGreen
L. BLULight Blue
NILNo Color Mark
ORGOrange
PNKPink
REDRed
SLDShield Wire
VLTViolet
WHTWhite
YELYellow

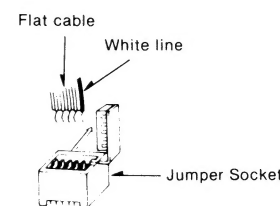
NOTES:

- The circuit shown in [] on the conductor side indicates printed circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. For measurement, use VTVM.

- This circuit board diagram may be modified at any time with the development of new technology.

Connection of a flat cable

To connect a flat cable, direct the cable so that its white line faces the right side as shown below, then insert the cable into a jumper socket and close the lid of the jumper socket.

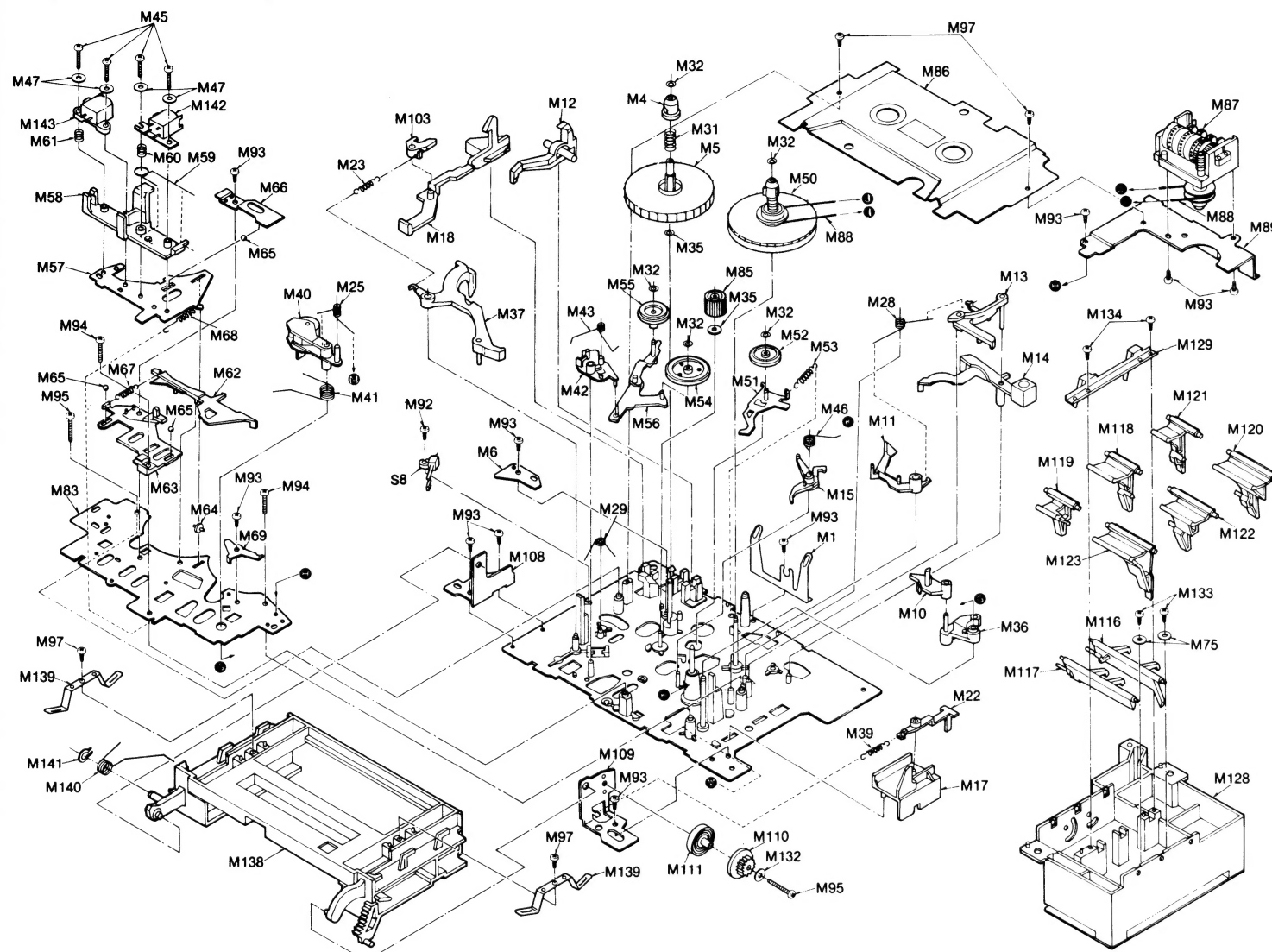


NOTES:

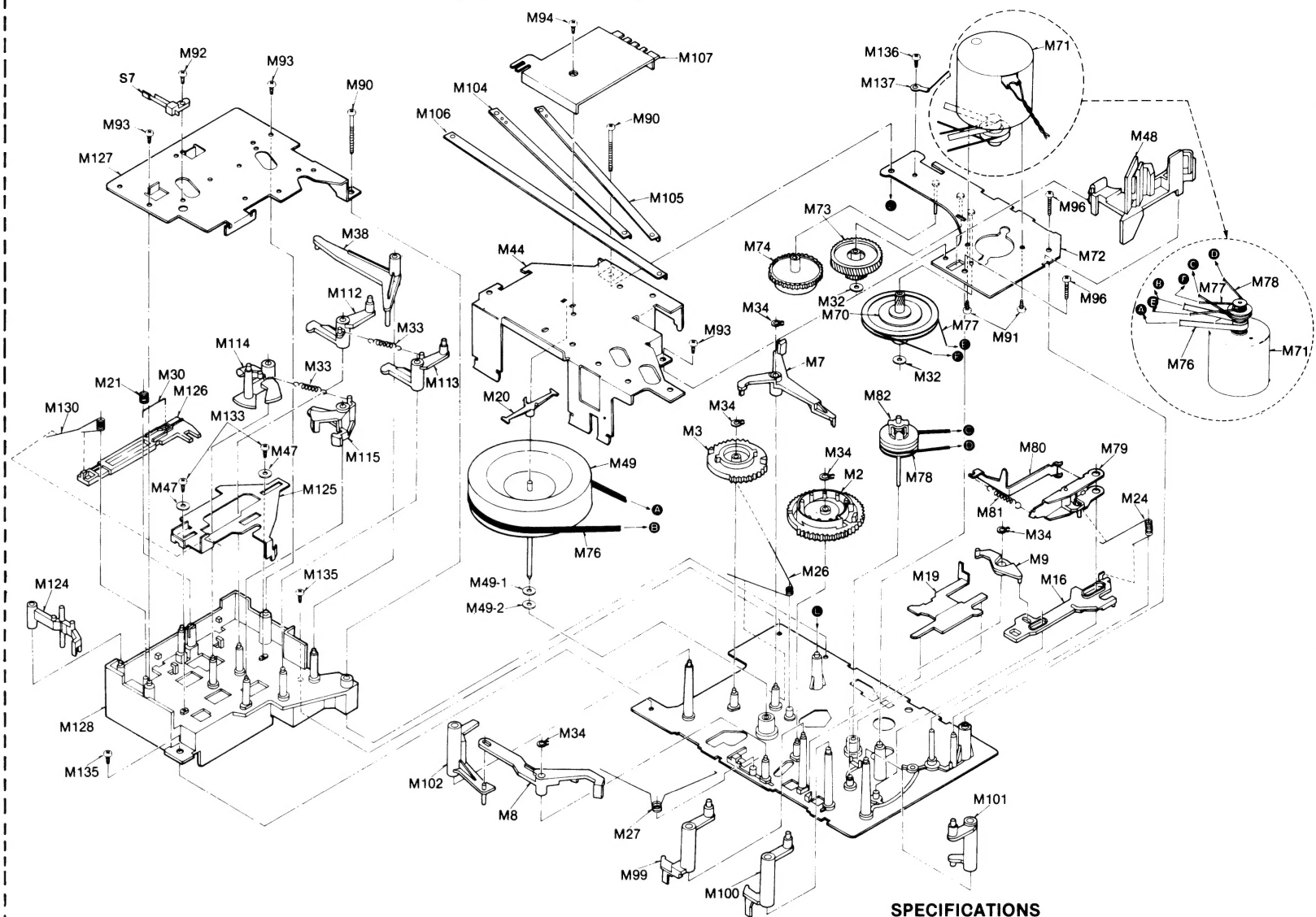
- []For all European areas except United Kingdom.
- []For United Kingdom.
- []For Asian PX.
- []For European PX.

MECHANICAL PARTS LOCATION

(FRONT VIEW)



(REAR VIEW)



When servicing this mechanism unit, refer to the disassembly notes and assembly instructions described in the service manuals of RS-M51, RS-M13, RS-M14 and RS-M04 (RS-M24 mechanism series).

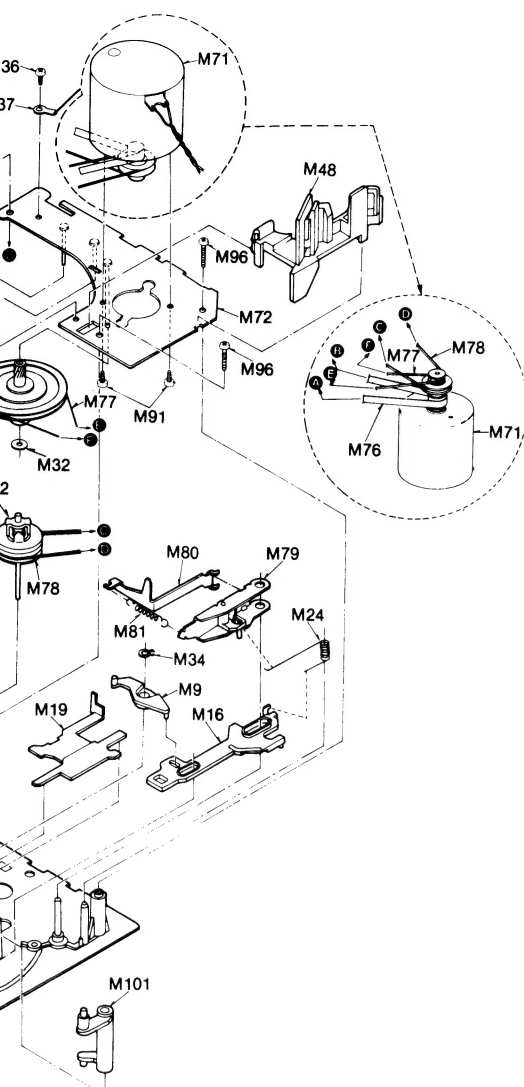
SPECIFICATIONS

Pressure of pressure roller	350±50g
Takeup tension * Use cassette torque meter.....QZZSRKCT	45± ¹⁵ / ₁₅ g-cm
Wow and flutter; (JIS) * Use test tapeQZZCWAT	Less than 0.08% (WRMS)

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS			M 20	QZM1283	Flywheel Thrust Retainer	M 40	QXL1381	Pressure Roller Assembly	M 57	QMK1840	Head Base Plate	M 79	QXL1360	Record/Playback Selection Arm Assembly	M 100	QML3886	Rewind Driving Lever
M 1	QBP1874	Cassette Pressure Spring	M 21	QBC1357	Lock Pin Pressure Spring	M 41	QBN1743	Pressure Roller Spring	M 58	QZM1241	Head Spacer	M 80	QML3580	Record/Playback Selection Lever	M 101	QML3887	Record Driving Lever
M 2	QDG1201	Main Gear	M 22	QML3896	Auto-Stop Selection Lever	M 42	QML3588	Fast Forward Lever	M 59	QBN1740	Head Pressure Spring	M 81	QBT1895	Record/Playback Selection Lever	M 102	QML3897	Play Changing Lever
M 3	QDG1202	Sub Gear	M 23	QBT1962	Main Lever Spring	M 43	QBN1748	Fast Forward Spring	M 60	QBCA0008	Head Spring	M 82	QXP0607	Record/Playback Selection Lever Spring	M 103	QML3901	Eject Obstruction Lever
M 4	QMB1336	Supply Reel Table Hub	M 24	QBN1739	Selection Lever Spring	M 44	QMA4410	Flywheel Retainer	M 61	QBCA0008	Head Spring	M 83	QX0607	Fast Forward Connection Plate	M 104	QMR2007	Fast Forward Connection Plate
M 5	QDR1139	Supply Reel Table	M 25	QBN1742	Pressure Roller Release Spring	M 45	XSN2 + 10	Screw Ø2×10	M 62	QML3591	Brake Arm	M 84	QX0607	Rewind Connection Plate	M 105	QMR2008	Rewind Connection Plate
M 6	QMF2118	Fast Forward Arm Bracket	M 26	QBN1744	Sub Gear Spring	M 46	QBN1741	Change Lever Spring	M 63	QZM1240	Sub Head Base Plate	M 85	QX0607	Record Connection Plate	M 106	QMR2009	Record Connection Plate
M 7	QML3899	Sub Control Lever	M 27	QBN1897	Main Gear Spring	M 47	XWG2B	Washer 2φ	M 64	QMN2550	Roller	M 86	QX0607	Connection Plate Retainer	M 107	QZM1288	Connection Plate Retainer
M 8	QML3898	Main Control Lever	M 28	QBN1746	Auto-Stop Lever Spring	M 48	QZM1254	Cord Clamper	M 65	QDK1017	Steel Ball 2φ	M 87	QX0607	Holding Angle-L	M 108	QMA4411	Holding Angle-L
M 9	QML3900	Record Operation Lever	M 29	QBN1747	Connection Spring	M 49	QXF0199	Flywheel Assembly	M 66	QBP1873	Head Base Plate Pressure Spring	M 88	QDB0169	Holding Angle-R	M 109	QMA4412	Holding Angle-R
M 10	QML3586	Head Base Plate Lift Lever	M 30	QBS1137	Pause Lock Pin	M 49-1	QBW2049	Poly Washer	M 67	QBT1597	Brake Arm Spring	M 89	QMA4439	Damper Gear	M 110	QDG1254	Damper Gear
M 11	QML3594	Auto-Stop Release Arm	M 31	QBC1372	Reel Table Spring	M 49-2	QBW2026	Snap Ring	M 68	QBT1892	Head Release Spring	M 90	XTN3 + 24B	Damper Retainer	M 111	QDP1920	Damper Retainer
M 12	QML3603	Erase Safety Lever	M 32	QBW2008	Poly Washer	M 50	QXD1143	Takeup Reel Table Assembly	M 69	QMA3858	Head Adjustment Plate	M 91	XSN26 + 3	Fast Forward Change Lever	M 112	QML3878	Fast Forward Change Lever
M 13	QML3604	Auto-Stop Driving Lever	M 33	QBT1961	Operating Change Lever Spring	M 51	QXL1382	Idle Lever Assembly	M 70	QZK0241	Takeup Gear Assembly	M 92	XTN2 + 6B	Rewind Change Lever	M 113	QML3879	Rewind Change Lever
M 14	QML3605	Auto-Stop Detection Lever	M 34	XUB3FT	Stop Ring 3φ	M 52	QX10111	Takeup Idler Assembly	M 71	QXU0297	Motor Assembly	M 93	XTN26 + 6B	Record Change Lever	M 114	QML3880	Record Change Lever
M 15	QML3592	Change Lever	M 35	QBW2012	Poly Washer	M 53	QBT1893	Takeup Idler Spring	M 72	QXK2286	Sub Chassis Assembly	M 94	XTN26 + 10B	Play Change Lever	M 115	QML3881	Play Change Lever
M 16	QMR2013	Record Rod	M 36	QXL1354	Sub Lever Assembly	M 54	QX10113	Fast Forward Idler Assembly	M 73	QDG1199	Auto-Stop Gear	M 95	XTN26 + 12B	Lock Arm-A	M 116	QML3883	Lock Arm-A
M 17	QMR2011	Auto-Stop Connection Rod	M 37	QXL1355	Main Lever Assembly	M 55	QX10112	Rewind Idler Assembly	M 74	QDG1200	Cam Gear	M 96	XTN3 + 10B	Lock Arm-B	M 117	QML3884	Lock Arm-B
M 18	QMR2014	Eject Rod	M 38	QML3882	Pause Change Lever	M 56	QXL1383	Fast Forward Arm Assembly	M 75	XWG2	Washer 2 φ	M 97	XTN26 + 5BFZ	Play Lever	M 118	QML3888	Play Lever
M 19	QMR2012	Control Rod	M 39	QBT1682	Lock Retainer Spring				M 76	QDB0324	Capstan Belt	M 98	QML3885	Stop lever	M 119	QML3889	Stop lever
									M 77	QDB0274	Takeup Belt	M 99	QML3885	Fast Forward Lever	M 120	QML3890	Fast Forward Lever
									M 78	QDB0273	Fast Forward Belt						

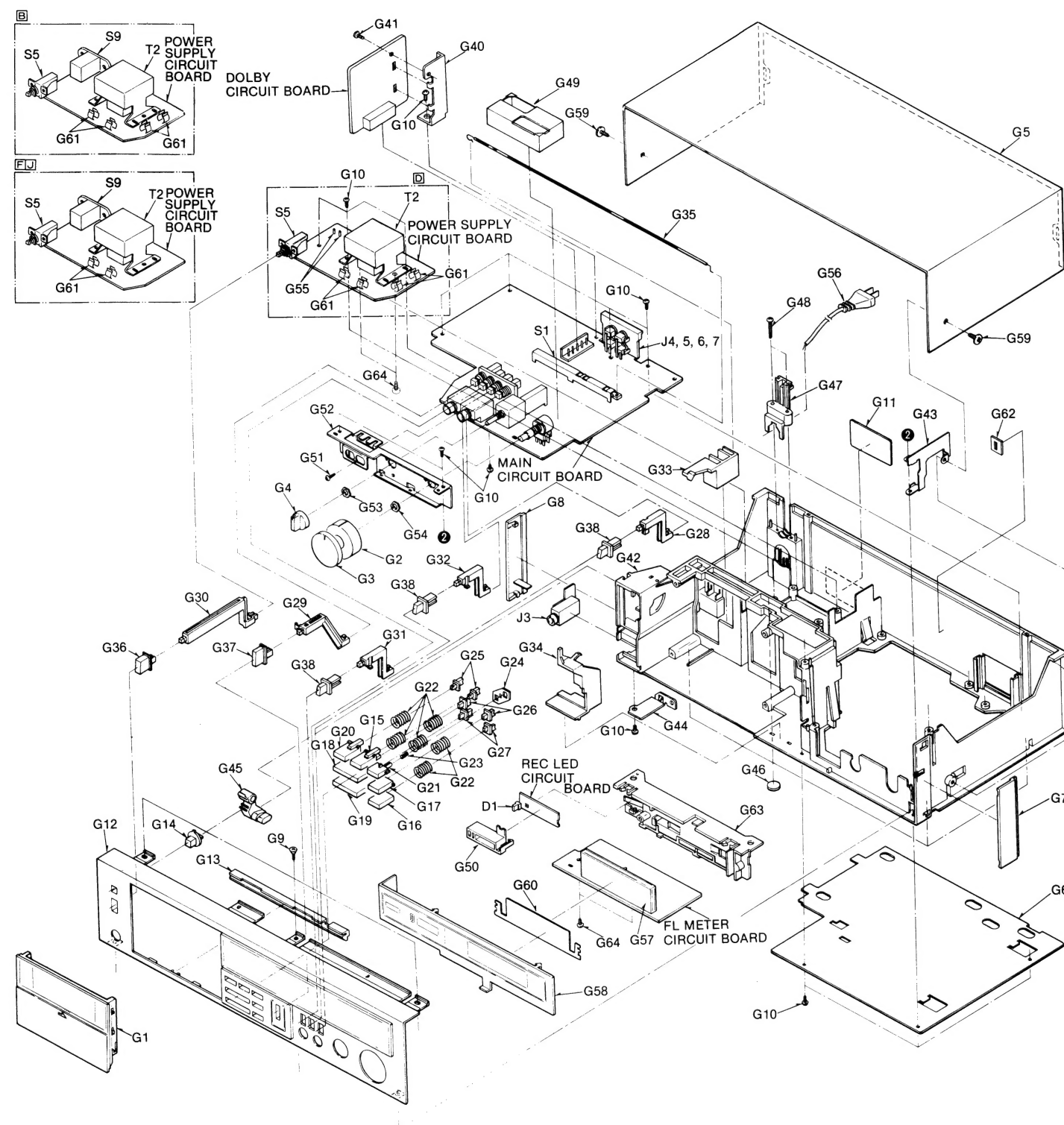
CABINET PARTS LOCATION



SPECIFICATIONS

Pressure of pressure roller	350±50g
Takeup tension * Use cassette torque meter.....QZZSRKCT	45± ¹⁵ ₁₅ g-cm
Wow and flutter; (JIS) * Use test tapeQZZCWAT	Less than 0.08 % (WRMS)

Option	Ref. No.	Part No.	Part Name & Description
Lever Operation	M 121	QML3891	Rewind Lever
	M 122	QML3892	Record Lever
	M 123	QML3893	Pause Lever
	M 124	QML3894	Muting Lever
	M 125	QMR2006	Fast Wind Rod
	M 126	QMR2010	Pause Rod
Plate Container	M 127	QMF2245	Operating Button Plate
	M 128	QKJ0537	Operating Button Frame
	M 129	QBP1953	Operating Lever Spring
	M 130	QBN1898	Fast Wind Rod Spring
a r	M 131	QBW2020	Washer
	M 132	XWG26	Washer 2.6φ
	M 133	XTN2 + 5B	Tapping Screw $\varnothing 2 \times 5$
	M 134	XTN2 + 4BFZ	Tapping Screw $\varnothing 2 \times 4$
	M 135	XTN3 + 6B	Tapping Screw $\varnothing 3 \times 6$
	M 136	XTN3 + 12B	Tapping Screw $\varnothing 3 \times 12$
	M 137	QJT0015	Lug Terminal
	M 138	QKF2105	Cassette Holder
	M 139	QBP1923	Holder Spring
	M 140	QBN1937	Eject Spring
	M 141	XUB5FT	Stop Ring
	M 142	QWY4122Z	Record/Playback Head
	M 143	QWY2138Z	Erase Head




NOTES:

☐For all European areas except United Kingdom.

☐For United Kingdom.

☐For PX.

REPLACEMENT PARTS LIST

Important safety notice
Components identified by  mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
CABINET PARTS			G 41	XTN3+8BFZ	Tapping Screw $\oplus 3 \times 8$
G 1	QYF0640	Cassette Lid Assembly	G 42 [D]	QKM1558K	Main Case
	"Silver Type"		[For all European areas except United Kingdom.]		
	QYF0640K	Cassette Lid Assembly	[BFJ]	QKM1585K	Main Case
	"Black Type"		[For United Kingdom and PX.]		
G 2	QYT0647	Volume Knob-R Assembly	G 43	QJC0054	Earth Plate-A
G 3	QYT0648	Volume Knob-L Assembly	G 44	QJC0057	Earth Plate-C
G 4	QGT1591	Knob (for Tape Selector)	G 45	QML3908	Eject Lever
G 5	QGC1231	Case Cover	G 46	QKA1093	Rubber Foot
	"Silver Type"		G 47 [D]	QKJ0550K	Cord Clamper
	QGC1231K	Case Cover	[For all European areas except United Kingdom.]		
	"Black Type"		[B]	QKJ0658	Cord Clamper
G 6	QGC1232	Bottom Cover	[For United Kingdom.]		
G 7	QKG3260	Side Panel-R	[FJ]	QKJ0552K	Cord Clamper
	"Silver Type"		[For PX.]		
	QKG3260K	Side Panel-R	G 48	XTN3+20B	Tapping Screw $\oplus 3 \times 20$
	"Black Type"		G 49	QTS1586	Shield Board
G 8	QKG3286	Side Panel-L	G 50	QKJ0549	L.E.D Holder
	"Silver Type"		G 51	XTN3+10BFZ	Screw $\oplus 3 \times 10$
	QKG3286K	Side Panel-L	G 52	QMA4440	Volume Angle
	"Black Type"		G 53	XNS8	Nut (8 ϕ)
G 9	XTS3+10B	Tapping Screw $\oplus 3 \times 10$	G 54	XNS9	Nut (9 ϕ)
G 10	XTN3+10B	Tapping Screw $\oplus 3 \times 10$	G 55 Δ	SJT777	Terminal
			G 56		
G 11 [D]	QGS3088	Main Name Plate	[D] Δ	SJA88	AC Power Cord
[For all European areas except United Kingdom.]			[For all European areas except United Kingdom.]		
	[B] QGS3089	Main Name Plate	[B] Δ	QFC1205	AC Power Cord
[For United Kingdom.]			[For United Kingdom.]		
	[FJ] QGS3015	Main Name Plate	[FJ] Δ	RJA522B-K	AC Power Cord
[For PX.]			[For PX.]		
G 12	QYP1179	Front Panel Assembly	G 57	QSIFL006F	FL Meter
	"Silver Type"		G 58	QKG3263	Meter Cover
	QYP1179K	Front Panel Assembly		"Silver Type"	
	"Black Type"			QKG3263Y	Meter Cover
G 13	QKG3259K	Spacer		"Black Type"	
G 14	QGO2059	Push Button (for Eject)	G 59	QH01324	Ornament Screw
G 15	QGOM0089	Push Button (for F.F)		"Silver Type"	
G 16	QGOM0095	Push Button (for Pause)		QH01324K	Ornament Screw
G 17	QGOM0093	Push Button (for Record)		"Black Type"	
G 18	QGOM0092	Push Button (for Playback)	G 60	QGL1177	Meter Filter
G 19	QGOM0094	Push Button (for Stop)	G 61		
G 20	QGOM0088	Push Button (for Rewind)	[DB] Δ	QTF1054	Fuse Holder
			[For all European areas.]		
G 21	QGOM0097	Push Button (for Counter Reset)	[FJ] Δ	QTF1060	Fuse Holder
			[For PX.]		
G 22	QBC1414	Button Spring-A	G 62	QKJ0636	Cord Clamper
G 23	QBC1187	Button Spring-B	G 63	QKJ0548	Meter Holder
G 24	QKJ0547	Spring Holder	G 64	XTN3+8B	Screw $\oplus 3 \times 8$
G 25	QKJ0544	Button Rod-A	ACCESSORIES		
G 26	QKJ0545	Button Rod-B	A 1 [DB]	QQT3476	Instruction Book
G 27	QKJ0546	Button Rod-C	[For all European areas.]		
G 28	QMR2026	Switch Rod-D	[FJ]	QQT3487	Instruction Book
G 29	QMR2027	Switch Rod-E	[For PX.]		
G 30	QMR2019	Switch Rod-C	A 2	XZB24X34A04	Polyethylene Bag (for A1)
G 31	QMR2028	Switch Rod-F	A 3	QEB0125	Connection Cord
G 32	QMR2101	Switch Rod-G	PACKINGS		
G 33	QML3907	Record/Playback Lever	P 1 [DB]	QPN4464	Inner Carton
G 34	QML3909	Counter Reset Lever	[For all European areas.]		
G 35	QBS1139	Record/Playback Connection Wire	[FJ]	QPN4465	Inner Carton
			[For PX.]		
G 36	QGO1900	Push Button (for Power ON/OFF)	P 2	QPA0675	Cushion-R
G 37	QGO2052	Push Button-B	P 3	QPA0676	Cushion-L
G 38	QGO2251	Push Button-D	P 4	QPA0683	Spacer
G 40	QMA4634	dbx P.B Holding Angle	P 5	QPC0072	Poly Sheet
			P 6	XZB40X60A02	Poly Sheet (for UNIT)